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J Trauma Stress. Author manuscript; available in PMC 2010 December 30.

Published in final edited form as:

J Trauma Stress. 2009 December ; 22(6): 575–584. doi:10.1002/jts.20474.

Testing Posttraumatic Stress as a Mediator of Physical, Sexual, and Psychological Intimate Partner Violence and Substance Problems Among Women

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Abstract

This study examined whether posttraumatic stress specifically resulting from intimate partner violence (IPV-related posttraumatic stress) mediated relationships between types of IPV and drug and alcohol problems among 212 women currently experiencing IPV. Six-month prevalence was high for drug use (48%) and alcohol use (59%). Structural equation modeling revealed that the frequency of physical, sexual, and psychological IPV were significantly and positively related to greater IPV-related posttraumatic stress, and IPV-related posttraumatic stress was significantly and positively related to drug problems. Further, IPV-related posttraumatic stress mediated the relationships between physical IPV and drug problems and psychological IPV and drug problems. Findings suggest that prevention and intervention efforts targeting posttraumatic stress among IPV-exposed women may reduce drug problems in this population.

Intimate partner violence (IPV) is a problem of major public health importance that is related to substance problems among women (Wekerle & Wall, 2002). Among IPV-exposed women, 7% - 44% report drug and alcohol problems severe enough to be diagnosed with substance abuse or dependence (Golding, 1999). Further, IPV-exposed women are more likely than women who are not exposed to IPV to report heavy or binge drinking (Bonomi et al., 2006; Lemon, Verhoek-Oftedahl, & Donnelly, 2002) and to abuse or be dependent on drugs and/or alcohol (McCauley et al., 1995; Tolman & Rosen, 2001).

Despite the high rates of substance misuse among IPV-exposed women, little research has examined factors that may increase the risk of drug and alcohol problems in this population. Yet the identification of such factors could inform treatment and prevention efforts. One potential factor is posttraumatic stress. IPV is related to high levels of posttraumatic stress (Coker, Weston, Creson, Justice, & Blakeney, 2005). In fact, 31% - 84% of IPV-exposed women report posttraumatic stress symptoms severe enough to be diagnosed with posttraumatic stress disorder (PTSD) (Golding, 1999).

Significant relationships between posttraumatic stress and substance problems are well documented across a wide range of populations (Breslau, Davis, & Schultz, 2003; Kessler, Sonnega, Bromet, Hughes, & Nelson, 1995; Schnurr & Spiro, 1999). In particular, IPV-exposed women are more likely to suffer from PTSD than women who have not been

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exposed, thus, IPV-exposed women may be especially vulnerable to drug and alcohol problems (Salomon, Bassuk, & Huntington, 2002; Tolman & Rosen, 2001). This hypothesis has not been thoroughly investigated. It has been shown that among low income and homeless single mothers, more than half of whom experienced IPV, PTSD was associated with drug and alcohol use (Salomon et al., 2002). Among IPV-exposed women, trauma-related symptoms including PTSD symptoms were related to heavy episodic alcohol use (Kaysen et al., 2007). Finally, among community-based IPV-exposed women, those who used drugs reported higher rates of PTSD and PTSD symptom severity than those who reported no drug use (Sullivan & Holt, 2008). Therefore, IPV-exposed women may be vulnerable to substance misuse partially due to IPV-related posttraumatic stress. Yet, we know of no tests of this hypothesis.

Additionally, examining IPV by type (i.e., physical, sexual, and psychological IPV) as it relates to posttraumatic stress and substance use may prove important. While each type of IPV has demonstrated a relationship to posttraumatic stress or substance use in at least one study, there have been no consistent trends across studies (Basile, Arias, Desai, & Thompson, 2004; Coker, Davis, et al., 2002; Coker, Smith, et al., 2002; Heru, Stuart, Rainey, Eyre, & Recupero, 2006; Houry, Kempland, Rhodes, & Kaslow, 2006; Smith, Thornton, DeVellis, Earp, & Coker, 2002; Testa & Leonard, 2001). Therefore, it is unclear whether any particular type of IPV places women at risk for IPV-related posttraumatic stress and drug and alcohol problems. One possible explanation for the inconsistencies found in prior work lies in methodological choices.

Most studies assess either the severity of PTSD symptoms or full criteria for the *disorder*. An examination of posttraumatic stress measured in the aforementioned ways provides invaluable information for treatment of PTSD and its correlates as well as for the design of future research. However, it also may be useful to examine posttraumatic stress by measuring symptom severity as well as the range of impairment in functioning experienced and whether or not an event qualifies as traumatic, but not adhere to full criteria to be diagnosed with the disorder (American Psychiatric Association, 1994). Given that many IPV-exposed women experience a range of PTSD symptoms but do not meet full criteria for PTSD, this measure of posttraumatic stress may help to further elucidate the relationships among IPV, posttraumatic stress, and substance problems and inform the development of substance use interventions for women who experience a range of posttraumatic stress.

The majority of studies examining the relationship between posttraumatic stress and substance use do so without a focus on the referent traumatic event for which PTSD is assessed (e.g., Najavits, Sonn, Walsh, & Weiss, 2004; Testa, Livingston, & Hoffman, 2007) despite the documented importance of the event in moderating relationships between trauma exposure and PTSD (Ozer, Best, Lipsey, & Weiss, 2003). Ozer and colleagues meta-analysis found that interpersonal trauma was more strongly related to PTSD than other traumatic events including natural disasters and combat. IPV is uniquely different from many other traumatic events in several ways. Exposure to IPV often is chronic rather than acute. Also, unlike other referent traumatic events where there is no identified perpetrator (e.g., natural disaster) or the perpetrator is not intimately known to the victim (e.g., enemy in combat), IPV is perpetrated within an intimate relationship by someone who likely is a source of stress *and* positive experiences and resources. Moreover, women who were victims of violence by intimate partners appear more likely to suffer from PTSD than women who were victims of violence by people with whom they were not intimate (Dansky, Byrne, & Brady, 1999). This body of literature suggests that IPV-related posttraumatic stress deserves particular attention in research.

The question arises then as to how IPV-posttraumatic stress could be related to substance problems among those with IPV. In line with tension reduction theory (Conger, 1956) and the self-medication hypothesis (Khantzian, 1997, 2003), IPV-exposed women may use substances to manage negative affect and, in particular, may select a drug of choice because of its effect on specific symptoms. Thus, it is not negative life events such as IPV per se that contribute to substance use and problems. Rather, it is negative affect resulting from IPV, such as posttraumatic stress that is related to substance problems. Although we know of no direct tests of this hypothesis among IPV-exposed women, there is evidence that posttraumatic stress partially mediated the relationship between other types of interpersonal violence (childhood sexual and physical abuse) and drug and alcohol use (Epstein, Saunders, Kilpatrick, & Resnick, 1998; Zlotnick et al., 2006). One study of women who were sexually assaulted as adults (not specific to IPV), however, found that lifetime PTSD symptoms did not mediate the relationship between women's sexual victimization and subsequent heavy drinking (Testa et al., 2007). Because IPV-related PTSD may be experienced differently than PTSD related to other traumatic events (for example, because of the chronic exposure to the referent traumatic event of IPV), it is necessary to test for mediation specifically among IPV-exposed women.

This study extends previous work on the relationships among IPV, posttraumatic stress, and substance use in several ways. First, we evaluated the relationships among types of IPV, IPV-related posttraumatic stress, and substance problems. Second, we examined these relationships utilizing a latent measure of posttraumatic stress. Third, we tested whether IPV-related posttraumatic stress mediated the relationships between types of IPV and substance problems. In order to examine the unique contributions of types of IPV and IPV-related posttraumatic stress to substance problems, we controlled for childhood trauma and past IPV, which are related to PTSD and substance problems (Coker, Davis, et al., 2002; Coker et al., 2005; Seedat, Stein, & Forde, 2005; Widom, 1999; Widom, Marmorstein, & White, 2006). Based on existing research and theory, it was predicted that physical, sexual, and psychological IPV would be positively related to drug and alcohol problems through their relationship with IPV-posttraumatic stress.

Method

Participants

Two hundred forty women were recruited from an urban community in New England. Recruitment flyers for the "Women's Relationship Study" invited women to participate "in a 2-hour interview about the relationship with your boyfriend or husband" and noted that "the study is completely confidential." Flyers were posted in community establishments such as grocery stores and nail salons, agencies such as the Department of Adult Education, and two primary care clinics. Eligibility was determined when women called to inquire about the study. The primary inclusion criterion was that a woman experienced at least one act of physical victimization within the past six months by her male partner as measured by selected screening questions from the Conflict Tactics Scale-2 (CTS-2; Straus, Hamby, & Warren, 2003). Other inclusion criteria were: (a) a current intimate relationship, (b) relationship length of at least six months, (c) partner contact at least twice weekly, (d) continuous partner contact (i.e., no more than two weeks apart), and (e) monthly household income no greater than \$4,200 which was determined a priori to methodologically control for differential resources associated with income. Of the 240 women, 28 failed to meet inclusion criteria during the interview; 212 women composed the final sample.

A two-hour, semi-structured, computer-assisted interview (NOVA Research Company, 2003) was administered by trained masters or doctoral-level female research associates. To protect participants' safety, all interviews were conducted in private offices. During the

process of informed consent, all women were asked if their participation would put them at risk. Interviewers were trained how to respond if the participant answered affirmatively. No participant reported safety concerns. After completion of the interview, all participants were debriefed, remunerated \$50, and provided with a list of community resources for employment, food, and benefits assistance, mental health and substance use treatment, and domestic violence services. Participants were asked if they wanted assistance accessing resources and assistance was provided when requested.

The average age of participants was 36.6 years ($SD = 10.5$). The majority of women were unemployed (65%), with a mean level of education of 12.1 years ($SD = 1.6$) and a mean annual household income of \$13,305 ($SD = \$10,390$). The average number of children was 2.3 ($SD = 2.1$) and mean years in the relationship was 6.5 ($SD = 6.4$) with more than half of the sample married or cohabitating (59%). One hundred forty-two women were African American, 43 were White, 17 were Latina, and 10 were identified as multiracial.

Measures

The lifetime and six-month prevalence of drug and alcohol use was determined using the Addiction Severity Index (ASI; McLellan, Kushner et al., 1992). The ASI also measured the frequency of drug use and the quantity and frequency of alcohol use over the previous six months and thirty days. Further, the ASI assessed family history of substance problems. A three category variable denoted 0 = *no family history*, 1 = *mother or father with a history*, and 2 = *mother and father with a history*.

Drug problems experienced over the previous six months were assessed with the 10-item version of the Drug Abuse Screening Test (DAST; Skinner, 1982). The drug problems variable analyzed in the model was created by summing affirmatively endorsed items (0 = *no*; 1 = *yes*) (such as “were you always able to stop using drugs when you wanted to” and “did you ever experience withdrawal symptoms [felt sick] when you stopped taking drugs”) to produce a total score; $\alpha = .87$. A score ≥ 3 reflects problematic use akin to a DSM-IV diagnosis of drug abuse (Skinner, 1982); this cut-off score was used to note the prevalence of positive screens for drug problems.

Alcohol problems experienced over the previous six months were assessed with the 10-item Alcohol Use Disorders Identification Test (AUDIT; Babor, Higgins-Biddle, Saunders, & Monteiro, 2001). The alcohol problems variable analyzed in the model was created according to Babor et al. by summing each item to produce a total score; a higher total score reflects a greater likelihood of risks and problems related to alcohol use; $\alpha = .90$. Although Babor et al. recommended a cut score of ≥ 8 to indicate alcohol problems, Selin (2003) found that a cut-off score ≥ 6 is more accurate for community women; this gender-specific cut score of ≥ 6 is used to note the prevalence of positive screens for alcohol problems.

IPV-related posttraumatic stress was measured with the 49-item Posttraumatic Stress Diagnostic Scale (PDS; Foa, 1995). To examine posttraumatic stress related to current IPV exposure, diagnostic criterion A was assessed in relation to IPV by the current partner for the duration of the relationship (personal communication, Foa, 2002). Diagnostic criteria (B) re-experiencing, (C) avoidance and numbing, (D) arousal symptoms, and (F) the symptoms' impact on functioning were assessed over the previous six months (American Psychiatric Association, 1994). IPV-related posttraumatic stress was included in the analytic model as a latent variable comprised of three indicators; (1) whether or not an event was considered traumatic according to criterion A (0 = *no*, 1 = *yes*), (2) the severity of re-experiencing, avoidance and numbing, and arousal symptoms (i.e., sum score of severity of 17 symptoms), and (3) impairment in functioning (i.e., count of life domains impacted by symptoms).

namely, household chores and duties, relationships with friends, fun and leisure activities, relationship with family, sex life, and general life satisfaction).

Frequency of physical, sexual, and psychological IPV was measured by the 78-item Conflict Tactics Scale – 2 (CTS-2; Straus et al., 2003). Sexual and psychological IPV also were measured by the Sexual Experiences Survey (Koss, Gidycz, & Wisniewski, 1987) and the Psychological Maltreatment of Women Inventory (Tolman, 1989) respectively because these measures assess their respective domains more comprehensively than the CTS-2 (e.g., the CTS-2 does not measure tactics of dominance and isolation or sexual coercion using drugs or alcohol). In the present study, the Sexual Experiences Survey and Psychological Maltreatment of Women Inventory were used to assess frequency of sexual and psychological IPV and the CTS-2 was used to assess frequency of physical IPV.

A referent time period of six months was used to assess the partner's commission of IPV behavior toward the woman. Physical and sexual IPV response options that were a range were recoded (Straus et al., 2003) [i.e., *never*, *once*, *twice*, *3 - 5 times* (recoded to 4), *6 - 10 times* (recoded to 8), *10 - 20 times* (recoded to 15), *to more than 20 times in the past six months* (recoded to 25)]. The physical IPV score was a sum of the 12 CTS-2 physical items, $\alpha = .88$. The sexual IPV score was a sum of the 10 Sexual Experiences Survey items, $\alpha = .89$. The psychological IPV score was a sum of the 48 items from the Psychological Maltreatment of Women Inventory with response options from 1 (*never*) to 5 (*very frequently*), $\alpha = .96$.

Past adult IPV was measured with a scale developed for this study since an established measure was not available. The Past Abusive Relationships measure (Swan & Sullivan, 2004) assesses the total number of past adult relationships in which women experienced IPV and the duration of the three most recent relationships. The past adult IPV variable was the duration, in months, of the three most recent relationships in which IPV occurred.

The Childhood Trauma Questionnaire (Bernstein & Fink, 1998) is a 28-item self-report inventory that assesses childhood physical, sexual, and emotional abuse and physical and emotional neglect. Items are rated on a five-point scale from *never true* (1) to *very often true* (5). A sum score of the 25 trauma items was used in the analyses, $\alpha = .93$.

Data Analysis

To produce normal distributions (Tabachnick & Fidell, 2007), drug problems, physical IPV, and childhood trauma variables were log10 transformed and alcohol problems and past IPV variables were square root transformed. Because of severe skew, sexual IPV was categorized (0 = *no occurrences*, 1 = *one occurrence*, 2 = *greater than one occurrence*). Transformed scores were created for the purpose of structural equation modeling (Raw scores are noted in Table 2). Bivariate methods determined inclusion of demographic variables in the analytic model (i.e., household income, education, age, race, employment status, cohabitation status, length of time in relationship). As a result of non-significant relationships ($p > .10$), no demographics were included.

Structural equation models (SEM) were tested using AMOS 16.0 (SPSS Inc, 2007). Full information maximum likelihood estimation was used to generate standardized parameter estimates because it is robust to violations of multivariate normality and performs well for model estimation with missing data by estimating variable means and intercepts (Peters & Enders, 2002). The theoretical model (see Figure 1) was tested using Kenny's three-step approach to testing model fit (1999) which is based on Anderson and Gerbing's two-step approach (1988). First, the fit of the measurement model was tested whereby all possible correlations among the latent variable (i.e., IPV-related posttraumatic stress) and observed

variables (i.e., all other model variables) were specified. Second, the structural model was tested whereby “deleted” paths (i.e., paths that were not hypothesized in the theoretical model and thus implicitly set to 0) were tested to guard against specification error, in other words, to determine if they were erroneously omitted. Third, structural paths specified in the theoretical model were tested, and non-significant ($p > .05$) paths were trimmed. Non-significant direct paths were retained between any two variables for which an indirect path needed to be tested or when the effects of a variable needed to be controlled for. Sobel’s (1982) test was used to test the statistical significance of mediated (i.e., indirect) effects. Sobel’s test does not require a direct effect of IPV on drug or alcohol use problems (see MacKinnon, Fairchild, & Fritz, 2007). In addition to standard measures of model fit (i.e., χ^2 , CFI, RMSEA) the Akaike Information Criterion, AIC (Akaike, 1974), was used to compare the fit of non-nested models. The model with the lower AIC is the preferred model because it possesses better balance of model fit and parsimony.

Results

Sample Description

Descriptive data regarding lifetime, six-month, and thirty-day prevalence of drug and alcohol use are reported in Table 1. Of those who screened positive for drug (21%) or alcohol (29%) problems, 53% and 73%, respectively, had not received any substance use treatment during the previous six months. As reported by Sullivan and Holt (2008), 55% reported an IPV incident that met DSM-IV criterion A (American Psychiatric Association, 1994). During the past six months, 98% endorsed at least one of the seventeen symptoms; specifically, 88% reported re-experiencing symptoms consistent with criterion B, 71% reported avoidance and numbing symptoms consistent with criterion C, and 88% experienced arousal symptoms consistent with criterion D. Thirty-four percent met full criteria for PTSD.

By nature of inclusion criteria, all women experienced at least one act of physical victimization in the past six months. Seventy one percent experienced severe physical victimization; 59% sustained minor injuries as a result of IPV and of those, 40% sustained severe injuries. Forty-four percent experienced no sexual victimization, 17% experienced sexual coercion or attempted rape, and 39% experienced rape by their partners. All women experienced tactics of dominance/isolation and emotional/verbal abuse; the dominance and isolation subscale mean was 59.4 ($SD = 18.9$) and on the emotional/verbal abuse subscale mean was 67.5 ($SD = 18.1$). Eighty seven percent experienced at least one past abusive relationship and 97% endorsed at least one trauma item on the Childhood Trauma Questionnaire (Bernstein et al., 2003).

Means, standard deviations, and ranges are included in Table 2. Correlations are included in Table 3. As predicted, the three indicators of the latent variable IPV-related posttraumatic stress were positively and significantly correlated with drug problems. Contrary to expectation, none of these indicators were correlated with alcohol problems and no type of IPV was correlated with drug or alcohol problems. Alcohol problems was retained as a dependent variable until model testing indicated otherwise because (a) the relationship of the latent variable to alcohol problems was a theoretical focus of this study, (b) the relationships between two of the indicators and alcohol problems approached significance ($p < .10$) and it was thought that they might reach significance when controlling for other factors in the model, (c) it is not possible to know whether a latent variable is related to another component of the model by examining correlations among its indicators and other observed variables, and (d) drug and alcohol problems are often highly correlated and may not be distinct, therefore, a conservative approach was taken whereby alcohol problems was initially modeled.

Model Testing

The first step in model testing was to fit the measurement model. The measurement model was tested among the latent variable of IPV-related posttraumatic stress and all model observed variables (see Figure 1). Each of the three indicators of IPV-related posttraumatic stress loaded onto the latent variable with a standardized weight greater than .45 (see Figure 2). The fit of the IPV-related posttraumatic stress measurement model was excellent, $\chi^2(16) = 18.22, p = .31, \chi^2/df = 1.14, CFI = .99, RMSEA = .03$ (CI = .00 - .07), AIC = 140.22.

The second step in model testing was to respecify the theoretical/structural model. The theoretical/structural model is depicted in Figure 1. “Deleted” paths were tested, found non-significant and therefore, not included in the model. Next, all paths specified in the theoretical model were tested for significance. Non-significant paths ($p > .05$) were removed from the model, with the following exceptions. Non-significant direct paths were retained between any two variables for which an indirect path needed to be tested. To control for the relationships of childhood trauma and past adult IPV¹ to all other model variables, these paths were retained even when non-significant.

The third step in model testing was to delete non-significant paths. The above specifications produced a model that provided good fit to the data, $\chi^2(15) = 16.92, p = .32, \chi^2/df = 1.13, CFI = .99$ and an RMSEA = .03 (CI = .00 - .07), AIC = 116.92, but included numerous non-significant paths. None of the paths from family history of substance problems to any other variables were significant and therefore, it was excluded from the final model. None of the direct or indirect effects on alcohol problems were significant so alcohol problems also was excluded from the model.

Final Model

The final model was the most parsimonious and provided excellent fit to the data, $\chi^2(13) = 16.33, p = .23, \chi^2/df = 1.26, CFI = .99, RMSEA = .04$ (CI = .00 - .08), AIC = 98.33. As the AIC for the final model was less than that of the theoretically specified model, the decision to exclude family history of substance problems and alcohol problems was further supported. The final model explained 13% of the variance in drug problems (see Figure 2).

As expected, physical ($\beta = .26, p < .001$), sexual ($\beta = .16, p < .05$), and psychological ($\beta = .35, p < .001$) IPV were significantly and positively related to greater IPV-related posttraumatic stress. Consistent with our theoretical model, IPV-related posttraumatic stress was the only variable to demonstrate a direct relationship to drug problems ($\beta = .37, p < .01$).²

Also consistent with expectation, each type of IPV indirectly influenced drug problems through greater IPV-related posttraumatic stress. Sobel tests found that IPV-related posttraumatic stress significantly mediated the effect of physical ($z = 2.32, p < .05$) and psychological ($z = 2.52, p = .01$) IPV on drug problems. IPV-related posttraumatic stress did not mediate the relationship between sexual IPV and drug problems ($z = 1.88, p = .06$) but its effect size warrants consideration because it approaches significance.

¹A model also was tested with a dichotomous variable indicating the presence of any past abusive relationships in place of the continuous variable indicating the number of months in the previous 3 abusive relationships. Model fit and results did not change meaningfully.

²Given the novelty of the measurement of posttraumatic stress as a latent construct, we also tested Figure 1 (a) with a PTSD diagnostic score and then (b) with a symptom severity score. Regarding the primary relationships of interest between IPV-related posttraumatic stress and substance problems, results are consistent with those of the latent construct. Posttraumatic stress, regardless of how it was measured, was significantly and positively related to drug problems and was unrelated to alcohol problems. Some of the relationships between other variables and posttraumatic stress were affected. Readers interested in complete results of these analyses may contact the corresponding author.

Discussion

This is the first known examination of the relationships between types of IPV, IPV-related posttraumatic stress, and drug and alcohol problems among a community sample of IPV-exposed women. Results suggest that IPV-related posttraumatic stress may play a key role in substance problems among this population. IPV types were related to greater IPV-related posttraumatic stress and in turn, IPV-related posttraumatic stress was associated with greater drug problems. These findings have implications for the prevention and treatment of drug use among this population as well as future research.

The indirect relationship between types of IPV and drug problems is particularly interesting when considered in light of the seemingly mixed findings of prior studies (Coker, Davis et al., 2002; Coker, Smith et al., 2002; Heru et al., 2006; Smith et al., 2002; Testa & Leonard, 2001). The present data suggest these relationships may occur, in part, through women's experience of greater levels of IPV-related posttraumatic stress. Seemingly discrepant findings of prior work may be due, at least in part, to failure to account for IPV-related posttraumatic stress or differential measurements of posttraumatic stress as symptom severity or a diagnosis. Discrepant findings also may be a result of the examination of different substance use outcomes (i.e., substance use versus substance problems). Two prior studies examined drug *use* (Coker et al., 2002; Testa & Leonard, 2001), yet frequency of drug use may not be a sufficient measure of drug problems. Future work is necessary to identify the mechanisms underlying these associations.

Results support our theoretical model that type of IPV in and of itself may not be related to drug problems. Rather, consistent with tension-reduction models of substance use (Conger, 1956; Khantzian, 1997, 2003), our data suggest that IPV-related posttraumatic stress may be one type of negative affect associated with greater drug problems among IPV-exposed women. IPV-exposed women may be using drugs to manage the negative affect associated with posttraumatic stress which, in turn, may contribute to greater numbers of associated problems. This result is consistent with prior work finding that negative affective states such as anxiety are associated with the use of drugs to manage negative affect (Buckner, Bonn-Miller, Zvolensky, & Schmidt, 2007) and that the use of substances to manage negative affect is associated with greater substance problems (Cooper, 1994; Cooper, Russell, Skinner, & Windle, 1992). Worthy of mention is that there was a small, marginally significant, negative relationship between psychological IPV and drug problems. Consistent with the self-medication hypothesis, perhaps drugs are not effective at targeting the non-PTSD related sequelae of psychological IPV such as poor self-esteem and self-blame.

The non-significant relationship of IPV-related posttraumatic stress to alcohol problems is contrary to our hypothesis but consistent with some existing research (Heru et al., 2006; Smith et al., 2002; Testa et al., 2007). Khantzian (2003) notes that people select a drug of choice based on its psychopharmacologic properties and that alcohol in lower doses targets affective numbing and in higher doses targets emotional flooding and fragmentation. This raises at least three possibilities for the non-significant findings. One possibility is that many women did not choose alcohol as their drug of choice to self-medicate their symptoms. The second possibility is that women used alcohol in lower doses to manage affective numbing and that lower doses aren't related to alcohol problems per se. A third possibility is that because this is a community sample and not a treatment-seeking sample, higher doses/greater use of alcohol is not prevalent enough for a relationship to be detected to alcohol problems. An additional explanation is that the use of alcohol to manage posttraumatic stress does not contribute to a greater number of alcohol problems because alcohol is legal and socially acceptable (unlike drug use). The relationships among IPV, posttraumatic stress, and alcohol use clearly warrant further study.

Additional findings are particularly noteworthy. For instance, data indicate that observed relationships cannot be accounted for by the co-occurrence of a history of childhood trauma, past adult IPV, and drug problems. Further, data indicate that the prevalence of drug use in this sample is of concern since it is substantially higher than national estimates. In the present study, 34% of women reported past 30-day drug use compared to 6% of women nationally (Substance Abuse and Mental Health Services Administration, 2006). Future work is necessary to identify vulnerability factors associated with drug initiation and maintenance among IPV-exposed women, as these rates of use are particularly troublesome given the number of associated adverse health consequences (McLellan, Alterman, Cacciola, Metzger, & O'Brien, 1992; Substance Abuse and Mental Health Services Administration, 2006).

The present study should be considered in the context of the following limitations. First, the cross-sectional nature of the study limits the ability to determine temporal sequence. Future work is needed to confirm whether IPV and IPV-related posttraumatic stress serve as risk factors for the development of drug problems or whether drug problems serve as risk factors for IPV exposure and posttraumatic stress. Second, the present study did not include drug and alcohol use disorder diagnoses. Although the range of problems endorsed by some participants suggest that a good number of participants experience clinically relevant drug and/or alcohol problems, future work examining diagnostic levels of drug and alcohol impairment is warranted. Third, the sample was comprised of women who currently experienced physical IPV. Thus, future work examining the relationships among women with sexual and/or psychological IPV without physical IPV is warranted to fully elucidate the relationships of drug and alcohol problems with types of IPV. Fourth, the present study examined the role of IPV-related posttraumatic stress given a priori hypotheses that negative affect associated with IPV might play a role in drug and alcohol problems. However, given that IPV-exposed women are vulnerable to experiencing PTSD symptomatology due to their high rates of other trauma histories (Pico-Alfonso, 2005) future work should examine whether observed relationships are specific to IPV-related posttraumatic stress or whether posttraumatic stress generally in this population contributes to risk for drug and alcohol problems.

Future Directions

Data from the present investigation suggest that IPV-exposed women with high frequencies of physical, sexual, and psychological IPV in their current relationships are vulnerable to greater numbers of drug problems if they experience greater rates of posttraumatic stress. Interestingly, it appears that drug problem vulnerability is at least partially accounted for by IPV-related posttraumatic stress as a result of current IPV. Moreover, the relationship between type of IPV and drug problems is not better accounted for by history of childhood trauma or past adult IPV experience. Model findings, in combination with (a) the prevalence of drug and alcohol use and (b) that two-thirds of women using drugs were not in treatment, suggest the need for prevention and early intervention efforts targeting IPV-related posttraumatic stress symptomatology specifically for IPV-exposed women to prevent substance-related impairment. Further elucidation of the mechanisms underlying the high rates of drug and alcohol problems among IPV-exposed women could have important implications for the development of prevention and treatment programs for high-risk individuals.

Acknowledgments

The research described here was supported, in part, by grants from the National Institute on Drug Abuse (R03 DA17668; K23 DA019561; T32 DA019426; R25 DA020515; F31 DA021457).

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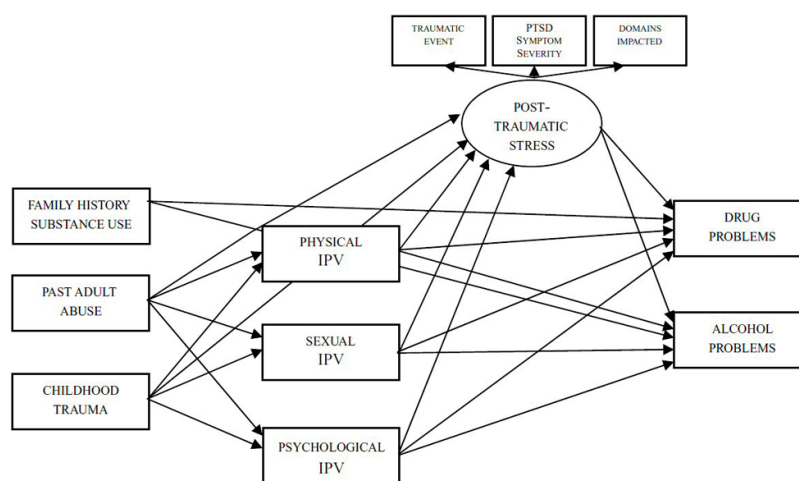
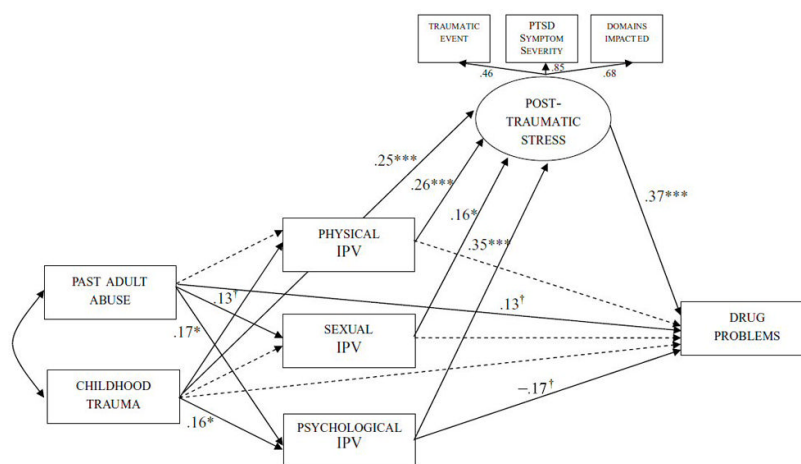


Figure 1.
Theoretical Model for IPV, IPV-related posttraumatic stress, and Drug and Alcohol Problems. IPV = Intimate Partner Violence.

**Figure 2.**

Path Model for IPV, IPV-related posttraumatic stress, and Drug Problems

Note. Covariances between IPV types were analyzed between disturbance terms. Dashed lines indicate paths that were tested but were non-significant $p > .10$. IPV = Intimate Partner Violence.

† $p < .10$. * $p < .05$. ** $p < .01$. *** $p < .001$.

Table 1

Substance Use Prevalence and Substance Use Related Problems (n = 212)

	Lifetime		6-month		30-day	
	%		%	M days of use (SD)	%	M days of use (SD)
Drug use prevalence	82.1	48.1	--	34.0	--	--
Cannabis	69.3	23.6	35.9 (54.8)	15.1	10.3 (12.0)	
Cocaine	49.5	21.7	30.9 (35.5)	11.3	6.6 (7.4)	
Other opiates (e.g., oxycotin)	27.4	17.0	58.8 (71.4)	12.7	14.3 (13.5)	
Sedatives, hypnotics, tranquilizers	16.5	9.4	86.2 (74.5)	7.1	19.5 (13.1)	
Heroin	20.3	5.7	28.9 (53.6)	1.9	3.8 (4.2)	
Amphetamines	8.5	0.9	38.0 (31.1)	0.5	30.0 (--)	
Hallucinogens	16.5	0.9	1.0 (0.0)	0.5	1.0 (0.0)	
Barbiturates	4.7	0.5	2.0 (0.0)	--	--	
Inhalants	3.8	--	--	--	--	
Alcohol use prevalence	90.1	59.4	21.7 (38.7)	49.5	6.3 (6.8)	

Table 2

Means, Standard Deviations, Range, and Prevalence of Study Variables (N = 212)

Variable	<i>M</i> (Prevalence or Mode)	<i>SD</i>	Range
Drug problems	1.6	2.3	0-10
Alcohol problems	4.9	6.9	0-34
PTSD criterion A (%)	(55)	—	0-1
PTSD symptom severity	19.2	11.7	0-48
PTSD domains impacted ^a	3.1	2.2	0-7
Frequency of physical IPV	35.2	47.1	1-209
Sexual IPV (%)	(56)	—	0-2
Frequency of psychological IPV	19.2	11.7	53-223
Past adult IPV	58.0	78.2	0-384
Family history of substance problems ^c	(1)	—	0-2
Childhood trauma	48.2	19.1	25-118

Note: Means, standard deviations, and ranges are untransformed scores. IPV = intimate partner violence.

^aPTSD domains impacted = count of life domains impacted by PTSD symptoms namely, household chores and duties, relationships with friends, fun and leisure activities, relationship with family, sex life, and general life satisfaction

^bBecause of severe skew, sexual IPV was categorized (0 = *no occurrences*, 1 = *one occurrence*, 2 = *greater than one occurrence*).

^cFamily history of substance problems = A three category variable (0 = *no family history*, 1 = *mother or father with a history*, and 2 = *mother and father with a history*); reported is the mode.

Table 3

Correlations Among Study Variables (N = 212)

Variable	1	2	3	4	5	6	7	8	9	10
1. Total drug problems	—									
2. Total alcohol problems	.46***	—								
3. PTSD criterion A	.17*	.14†	—							
4. PTSD symptom severity	.24**	.12	.37***	—						
5. PTSD domains impacted	.28***	.15	.32***	.59***	—					
6. Frequency of physical IPV	.11	.09	.27***	.48***	.27***	—				
7. Sexual IPV	.13†	.11	.19**	.26***	.31***	.24***	—			
8. Frequency of psychological IPV	.07	.01	.25***	.50***	.36***	.51***	.27***	—		
9. Past adult IPV	.17*	.10	-.01	.18**	.11	.09	.12	.19**	—	
10. Family history of substance problems	-.01	.10	-.02	.08	.11	.02	-.11	.01	.06	—
11. Childhood trauma	.14†	.12	.19**	.32***	.27***	.18**	.11	.17*	.08	.23**

Note: Correlations are based on transformed scores.

*
 $p < .05$.**
 $p < .01$.***
 $p < .001$.